

# Notice of Allowability

Application No.

09/823,470

Examiner

Mohammad A. Siddiqi

Applicant(s)

YAMAGAMI, KENJI

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## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 12/30/2005.
2. ☒ The allowed claim(s) is/are 1,2,5-21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

  
JOHN FOLLANSBEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100

## **DETAILED ACTION**

### **EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview Pavel Pogodin with on 03/31/2006.

2. Please amend the claims as attached.

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad A. Siddiqi whose telephone number is (571) 272-3976. The examiner can normally be reached on Monday -Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A. Follansbee can be reached on (571) 272-3964. The fax phone number for the

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organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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IN THE CLAIMS:

Please amend the claims as follows:

1.     *(Currently Amended)* A storage system apparatus,  
comprising:
  - a first storage system for storing data, and a second storage system remote from the first storage volume for storing a remote mirror copy of the data;
  - a plurality of alternative ports, providing switch-able connection from said first storage system via a plurality of networks to said second storage system, wherein the connection from said first storage system and said second storage system may be routed through at least two alternative ports of the plurality of alternative ports; said plurality of networks including a first network and a second network, said first network having a higher priority than said second network, the plurality of networks each having at least one of a plurality of status indications associated therewith; [[and]]
  - a processor; and
  - a network monitor operable to detect at least one condition within at least one of the plurality of networks and set at least one of the plurality of status indications;

wherein said processor is operable to use at least one user provided policy to select[[s]] at least one of said plurality of alternative ports to send data from the first storage system to the second storage system, said selection based upon a comparison of at least one condition in said plurality of networks against the at least one user provided policy and based upon at least one of the plurality of status indications.

2. *(Previously Presented)* The storage system apparatus of claim 1, wherein said at least one condition comprises at least one of a throughput, a busy rate, an error rate, and a presence of an error.

3. *(Cancelled)*

4. *(Cancelled)*

5. *(Original)* The storage system apparatus of claim [[3]] 1, wherein said status indication comprises at least one of available, temporarily unavailable, and unavailable.

6. *(Original)* The storage system apparatus of claim 1, wherein said policy comprises at least one of a threshold, a maximum, a minimum, an average, a mean, a limit, a constraint, a priority, and a target.

7. *(Original)* The storage system apparatus of claim 1, wherein said plurality of networks are grouped into a plurality of path groups, wherein said policies are associated with networks in a particular path group.

8. *(Previously Presented)* The storage system apparatus of claim 7, wherein said first storage system and said second storage system comprises a plurality of volumes.

9. *(Previously Presented)* The storage system apparatus of claim 8, wherein each of said plurality of volumes is permitted to access networks of at least one of said plurality of path groups.

10. *(Currently Amended)* A computer-implemented method comprising:

storing data in a primary storage volume;

specifying a first network to be used for transferring remote mirror copy data from the primary storage volume to a secondary storage volume remote from the primary storage volume, the first network having a first status indication of a plurality of status indications associated therewith;

specifying a first network port associated with said first network;

specifying a user-provided policy comprising a first-network-based constraint for said first network;

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specifying a second network to be used for transferring the remote mirror copy data from the primary storage volume to the secondary storage volume, the second network having a second status indication of the plurality of status indications associated therewith;

specifying a second network port associated with said second network;

making said first network a higher priority network than said second network;

detecting at least one condition within the first network and the second network;

setting at least one of the plurality of the status indications; and transferring said remote mirror copy data using said first network port associated with said first network when condition[[s]] in said first network are in accordance with said user-provided policy, otherwise transferring said remote mirror copy data using said second network port associated with said second network, wherein a connection between said primary storage and said secondary storage may be routed through either the first network port or alternatively through the second network port and wherein the aforesaid selection of the first network or the second network for transfer of the remote mirror copy is performed based on at least one of the plurality of the status indications.

11. (*Previously Presented*) The method of claim 10, further comprising:

transferring a portion of said data using said first network even when conditions in said first network are not in accordance with said constraint as a test;

monitoring conditions in said first network during said test; and  
returning to transferring said remote mirror copy data using said first network when said test reveals that conditions in said first network are again in accordance with said constraint.

12. (*Original*) The method of claim 10, wherein said first network is relatively less expensive to use than said second network.

13. (*Original*) The method of claim 10, wherein specifying said constraint for said first network comprises specifying at least one of a throughput, a busy rate, an error rate, and a presence of an error.

14. (*Original*) The method of claim 10, wherein said first network is a public network and said second network is a private network.

15. (*Previously Presented*) The method of claim 10, wherein said first network is a private network and said second network is a public network.



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16. (*Original*) The method of claim 10, further comprising:  
detecting an abnormal condition in said first network and  
thereupon transferring data using said second network.

17. (*Currently Amended*) A computer-implemented method for  
selecting a network, said method comprising:

providing primary storage for storing data;

providing secondary storage remote from the primary storage  
for storing a copy of the data, the secondary storage being coupled to  
the primary storage via a plurality of networks, the plurality of  
networks including a first network and a second network, the first  
network having a higher priority than said second network, the  
plurality of networks each having at least one of a plurality of status  
indications associated therewith;

[[monitoring]] detecting at least one condition in the plurality of  
networks;

setting at least one status indication of the plurality of status  
indications; [[and]]

comparing said at least one condition against at least one user  
provided policy; and

using said user provided policy to select at least one of a  
plurality of alternative ports connected to said plurality of networks in

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accordance with said comparison, wherein a connection between said primary storage and said secondary storage may be routed through at least two alternative ports of the plurality of alternative ports, wherein the aforesaid selection of at least one of a plurality of alternative ports is performed based on at least one of the plurality of the status indications.

18. (*Previously Presented*) The method of claim 17, wherein the selecting of at least one of a plurality of alternative ports comprises:

determining based upon a status indication whether to select a port from said plurality of alternative ports.

19. (*Previously Presented*) The method of claim 17, further comprising:

associating said plurality of networks with a plurality of path groups;

wherein said policy is associated with at least one of a plurality of path groups.

20. (*Currently Amended*) The method of claim 17, wherein the [[monitoring]] detecting of a condition comprises:

using a network monitor to detect a condition within at least one of said plurality of networks, and thereupon set a value in a status indication.

21. *(New)* The storage system apparatus of claim 17, wherein the status indication comprises at least one of available, temporarily unavailable, and unavailable.

22. *(New)* The storage system apparatus of claim 17, wherein the policy comprises at least one of a threshold, a maximum, a minimum, an average, a mean, a limit, a constraint, a priority, and a target.